DOCUMENT RESUME

ED 481 546 EC 309 852

TITLE	Promoting High Achievement: Policies and Programs for Academically Advanced Students in Massachusetts.
INSTITUTION	Massachusetts State Dept. of Education, Malden.
PUB DATE	2002-10-00
NOTE	32p.; Prepared by the Center for Teaching and Learning.
AVAILABLE FROM	Massachusetts State Department of Education, 350 Main Street, Malden, MA 02148-5023. Tel: 781-338-3000. For full text: http://www.doe.mass.edu/ FamComm/AAEreport.pdf.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	*Academically Gifted; Advanced Courses; Advanced Placement; Educational Legislation; Elementary Secondary Education; *Needs Assessment; School Districts; State Legislation; *State Programs; *State Surveys
IDENTIFIERS	*Massachusetts

ABSTRACT

This report describes initiatives and services of the Massachusetts Department of Education for academically advanced students. The first section summarizes the department's state initiatives implemented as a result of the state's Education Reform Act of 1993, such as grants to enhance district gifted and talented programs and Advanced Placement (AP) programs. The second section presents data from a 2002 survey of services provided to academically advanced students in individual Massachusetts school districts. Among findings of the survey at the elementary level are that when advanced instruction is provided, it is more likely to be available in the upper elementary and middle school grades than in the primary grades. Among survey findings at the high school level are that honors, advanced, and AP courses are offered in all the core academic subjects in most Massachusetts high schools. The report concludes with four recommendations for the State Department of Education: (1) incorporate measures of progress by academically advanced students into existing department initiatives; (2) establish an index of advanced achievement as part of the state accountability system; (3) provide professional development for teachers; and (4) develop educator preparation programs leading to special licensure. (Contains 26 references.) (DB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 481 546

Massachusetts
We help children learn.
Department of Education

Promoting High Achievement:

Policies and Programs for Academically Advanced Students in Massachusetts

Center for Teaching and Learning

October 2002

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
J. OKeefe
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
1

Massachusetts Department of Education
address 350 Main Street, Malden, MA 02148
telephone 781-338-3000 **internet** www.doe.mass.edu

EC 309852

2

BEST COPY AVAILABLE

Massachusetts Department of Education

This document was prepared by the Massachusetts Department of Education
Dr. David P. Driscoll, Commissioner of Education

Board of Education Members

James A. Peyser, Chairman, Dorchester

Henry M. Thomas, III, Vice-Chairman, Springfield

Charles D. Baker, Swampscott

J. Richard Crowley, Andover

Judith I. Gill, Chancellor, Higher Education, Boston

William K. Irwin, Jr., Wilmington

Mr. Jeff DeFlavio, Chair, Student Advisory Council, Belmont

Roberta R. Schaefer, Worcester

Abigail M. Thernstrom, Lexington

David P. Driscoll, Commissioner
and Secretary to the Board

The Massachusetts Department of Education, an Affirmative Action employer, is committed to ensuring that all of its programs and facilities are accessible to all members of the public. We do not discriminate on the basis of age, color, disability, national origin, race, religion, sex, or sexual orientation.

Copyright © 2002 Massachusetts Department of Education
Permission is hereby granted to copy any or all parts of this document for non-commercial educational purposes. Please credit the "Massachusetts Department of Education."

This document printed on recycled paper

350 Main Street, Malden, Massachusetts 02148-5023 #781-338-3000

Promoting High Achievement:
Policies and Programs for Academically Advanced Students in Massachusetts

Executive Summary

This report responds to a legislative request for information about initiatives of the Massachusetts Department of Education for academically advanced students and services for these students in the Commonwealth's public schools.

The report has three sections. The first section summarizes the Department of Education's state initiatives for academically advanced students implemented as a result of the Education Reform Act of 1993. These included grants to enhance district gifted and talented and Advanced Placement (AP) programs and joint initiatives with the Board of Higher Education such as Dual Enrollment, which allowed advanced high school students to take courses in the public higher education system while in high school. Other programs, for which the Massachusetts was awarded funds from the U. S. Department of Education, included AP fee reduction and AP incentive grants to low income districts. Funded at approximately $2.6 million to $2.8 million between 1996 and 2001, the state-funded components were suspended in 2002 as a result of the decline in the state budget. The Stanley Z. Koplik Certificate of Mastery, a recognition program for academically advanced high school juniors and seniors begun in 2000, will continue to be awarded in 2003.

The second part of the report presents data from a survey conducted by the Massachusetts Department of Education in 2002 about the services to academically advanced students provided in individual districts at the elementary, middle, and high school levels. Approximately half of the districts in the Commonwealth responded to the survey. The survey responses revealed broad trends in district approaches to academically advanced education.
In the elementary and middle grades:

- Academically advanced students in PreK-5 are more likely to be taught by elementary classroom teachers with some training in individualizing or "differentiating" instruction than by specialists in content or in gifted education.

- When advanced instruction is provided, it is more likely to be available in the upper elementary and middle school grades than in the primary grades.

- Academically advanced students in grades 6-8 are just about as likely to receive advanced instruction through differentiated classroom instruction as through separate advanced or accelerated courses.

- Students may receive no advanced instruction whatsoever in a third of the elementary schools and a fifth of the middle schools.

- The subject matter priorities in advanced instruction mirror the subject priorities of the regular PreK-8 classroom. Students are more likely to receive advanced instruction in reading and mathematics than in other subjects in PreK-8. They are also more likely to receive advanced instruction in science and history/social science in grades 4 and 5 than in middle school. It is relatively rare that they receive advanced instruction in foreign languages and rarer still that they receive advanced instruction in the arts.

At the high school level, the survey found that:

- Honors, advanced, and Advanced Placement courses are offered in all the core academic subjects in most Massachusetts high schools.

- Advanced courses in mathematics and the sciences are more common than advanced courses in the humanities, foreign languages, and the arts.

- Beginning in the mid-1990s, the opportunities for high school students to take Advanced Placement and college courses expanded, and the Certificate of Mastery Program provided an incentive for students to score high on MCAS in order to receive scholarships to state colleges and universities.

The third section of the report discusses findings on the academic preparation of K-8 teachers of the academically advanced. Because until 2001 Massachusetts did not have a specific license for K-8 Teacher of the Academically Advanced, educators currently working in this field hold a variety of other licenses. The 66 teachers who returned the survey on academic preparation held a total of 98 licenses.

- The majority held licenses that were not subject-specific (elementary education, followed by special education, middle school generalist, guidance, audio-visual specialist, principal and supervisor).

- Twenty-eight percent of the licenses held were in humanities disciplines.

- Nineteen percent of the licenses held were in mathematics or science disciplines.

The report concludes with recommendations, including:

- incorporating measures of progress by academically advanced students into existing Department initiatives in reading, mathematics, and instructional technology;

- establishing an index of advanced achievement as part of the state accountability system;

- providing professional development for K-8 teachers of the academically advanced and for high school teachers of honors, advanced, and AP courses; and

- developing educator preparation programs leading to licensure as K-8 teachers of the academically advanced in mathematics/science or the humanities.

Promoting High Achievement:
Policies and Programs for Academically Advanced Students in Massachusetts

Introduction

The Massachusetts Legislature's appropriation for the Gifted and Talented grant program in 2001 directed the Department of Education to conduct a study of state and district services for academically advanced students. This report responds to that request. In it we have used the term "academically advanced" throughout the study to refer to students who have achieved beyond the norm either on standardized assessments, or in classroom work, or in both areas. Our focus on demonstrated academic achievement reflects the legislative requirements of the Gifted and Talented program, which restricted funding to initiatives for students who are identified by one or more of these criteria:

- the result of a standardized aptitude examination that is three or more standard deviations above the norm;
- an evaluation by the student's teachers that the student does perform, or is capable of performing, satisfactorily at two or more grade levels above the student's chronological age; and/or
- a score on the mathematics or verbal Scholastic Aptitude Test by a student of no more than 13 years of age, which is equal to, or greater than, the average on either test obtained by college-bound high school juniors.

This study draws on Massachusetts Department of Education accounts of statewide initiatives in standards, assessment, teacher licensure, professional development, and accountability as well as data on district enrollments and district services for academically advanced students collected by the Department of Education in the spring of 2002. It addresses four main questions:

1. How do federal and state education policies support advanced academic achievement? What has Massachusetts done to encourage high achievement? What policies and funding sources exist in other states similar to Massachusetts in their development of standards, statewide assessments, and accountability systems? How are academically advanced initiatives coordinated at the Massachusetts Department of Education?

2. How do local school district practices support advanced academic achievement? Which services do Massachusetts school districts offer academically advanced students? Which subjects are taught at an advanced level in which grades? How are students identified to participate in academically advanced programs? What percentage of the grade level population is included in these programs? What advanced, honors, Advanced Placement, and college courses are offered to academically advanced high school students?

3. What are, or should be, the qualifications of teachers of academically advanced students? What are the teaching assignments, licenses, and qualifications of the teachers currently working with PreK-8 academically advanced students in Massachusetts? Which courses have been most useful to them? What are the implications for the field of the new license for K-8 Teacher of the Academically Advanced?

4. What might the Massachusetts Department of Education do to improve the education of academically advanced students? What current initiatives could be strengthened and what new policies could be developed to support high academic achievement?

1. Federal and State Education Reform Policies and High Academic Achievement

Federal Initiatives

Beginning in the 1980s, widespread concern among policymakers about the uneven quality of American elementary and secondary education led to a series of initiatives, often collectively referred to as "the education reform movement". During the 1990s the United States Department of Education supported the development of voluntary national standards in the core academic subjects of English language arts, mathematics, science, history, geography, civics, economics, foreign languages, and the arts. The federal government expanded the role of voluntary national student testing through the National Assessment of Educational Progress (NAEP) and provided funding for states to write state standards and assessments, stimulate the use of instructional technology, restructure school governance, and improve the quality of the teaching force. These initiatives included a variety of competitive grants for professional development, primarily in mathematics, science, and reading.

The reauthorization in 2001 of the Elementary and Secondary Education Act, *No Child Left Behind*, added new funding for education as well as new requirements for monitoring student achievement and elevating the quality of teaching. Under this act, states receiving federal funding for education must institute assessments in math and reading at every grade level from grades 3 to 8 and set measurable targets for yearly progress. States must also ensure that there are qualified teachers (defined in the federal law as teachers certified in the subjects they teach) for all students in all grades and courses by the 2005-2006 school year. There is expanded funding for a number of competitive and entitlement grants to improve PreK-12 education, including the Jacob Javits grants for Gifted and Talented Education, available in 2002 to both local school districts and states.

Massachusetts Initiatives

One of the key goals of the Massachusetts Education Reform Act of 1993 is to improve the academic achievement of *all* students. To achieve that goal, over the past nine years the Massachusetts Department of Education has

- published standards for academic achievement in its curriculum frameworks for English language arts, mathematics, science and technology/engineering, history and social science, the arts, foreign languages, and health;
- administered statewide assessments (the Massachusetts Comprehensive Assessment System, or "MCAS") based on the standards to measure students' achievement in English language arts, mathematics, science and technology/engineering, and history and social science;
- adopted a statewide graduation requirement based on student performance on high school MCAS assessments in English language arts and mathematics;
- developed a system of school and district accountability based on student academic achievement measured in statewide assessments;
- provided professional development aligned with the standards to increase teachers' content knowledge in major school subjects and elementary teachers' knowledge of teaching reading;
- required ongoing professional development for teachers in the content they teach for recertification on a five-year cycle;
- strengthened regulations for new teacher licensure, and
- instituted teacher tests of content knowledge and general communication skills for prospective teachers.

Massachusetts Initiatives and Funding for Academically Advanced Students

Unlike many other states, Massachusetts has no mandate for identifying academically advanced students or providing them special services.[1] The Department of Education's discretionary programs in this field are dependent on annual funding from the state Legislature and from federal grants. In FY03, facing a deep budget deficit, the Governor and the Legislature appropriated no funds to support academically advanced programs for Massachusetts public school students. Nonetheless, from 1996 to 2001, when both state and federal funds were available, the Department spent between $2.6 million to $2.8 million of combined state and federal funds annually for services to academically advanced students and for professional development. In FY02, the state revenues declined sharply. Although the Department of Education's overall budget increased between FY01 and FY02 ($4.15 billion in FY02, $3.94 billion in FY01), expenditures for academically advanced programs were reduced to approximately $1.4 million in FY02.[2] Over the past two years, the amount used for statewide grants and other programs for academically advanced education has ranged from a high of approximately .07 percent to a low of .03 percent of state education spending.

The funding for academically advanced services between 1996 and 2002 was divided between the following four initiatives. It is important to note that the first three of these programs, and 83% of the funding, largely benefit only students in their last two years of high school.

1. A dual enrollment program, approximately $1,000,000 to $1,780,000 annually, that allowed academically advanced high school juniors and seniors with at least a B average to take courses at no charge in the Commonwealth's public college and university system. This program was state-funded. [3]

2. An annual competitive grant program, totaling approximately $500,000 to $630,000 in each year, for the expansion of Advanced Placement courses in high schools and advanced coursework in middle schools serving low-income students. This program has been funded through a combination of state and federal funds.

3. A fee-reduction program for low-income students taking Advanced Placement exams. The annual expenditure varies depending on the number of students taking advantage of the program; from $30,000 to $50,000 in federal funds has been spent annually in Massachusetts.

4. An annual competitive grant program, totaling approximately $438,000 in each year from 1996 to 2001, for gifted and talented education, primarily in the elementary and middle schools. This discretionary program has been funded only by state funds.

Several other initiatives are supported by other sources or the Department's overall administration budget.

5. The Stanley Koplik Certificate of Mastery Award, given to high school juniors and seniors who have at least one *Advanced* score and one other *Advanced* or *Proficient* score on MCAS as well as high scores on Advanced Placement or Scholastic Achievement subject tests, college coursework, or other significant achievements. This certificate carries with it a potential tuition waiver, worth $700 to $1700 per year, for four years of undergraduate study at a state college or university. These costs are state-funded but are not included in the Department of Education's budget.

6. The creation of a new teacher license, PreK-8 Teacher of the Academically Advanced, adopted by the Board of Education in 2001.

7. Continuing support of a Gifted and Talented Advisory Council, whose purpose is to make recommendations to the Board of Education.

Initiatives and Funding for Low-Performing Students

The results of initial statewide assessments (MCAS) based on the standards of the frameworks revealed that substantial numbers of students could only demonstrate minimal competency in English language arts and mathematics. As a consequence, the Massachusetts Legislature invested resources in programs designed to raise the achievement of low-performing students. According to the Board of Education's 2001 annual report, "the Academic Support Service Program was created by the Legislature in 1998 to address the needs of students scoring in the *Warning/Failing* and *Needs Improvement* categories on MCAS."[4] In contrast to the approximately $2.6 million to $2.8 million spent on services to academically advanced students, the Legislature appropriated $20 million in FY99 and FY00, increasing to $40 million in FY01 and to $50 million in FY02 for supplemental tutoring in after-school, summer, and in-school programs.[5] This investment, coupled with teachers' increased attention to the standards and students' increased commitment to passing English language arts and mathematics tests (a graduation requirement in 2003), appears to have made a difference in raising test scores for many students. In 1998, 28% of the grade 10 students failed English language arts and 52% failed mathematics. Five years later in 2002, the failure rates had declined but were still high: 14% failed English language arts and 25% failed mathematics.

Advanced Scores on MCAS

As the failure rate at the lowest level declined, the percentages of students scoring *Advanced* on MCAS mathematics and English language arts assessments increased over the past 5 years at grade 10, although the changes are not as dramatic as they are for the *Failing* scores.[6] In the earlier grades, there has not been a sizeable increase in students scoring at the Advanced level in either subject. Table 1 shows the percentages of students scoring at the *Advanced* level in Mathematics and English language arts from 1998 to 2002.[7]

Table 1. Statewide Percentages of Students Scoring at the *Advanced* Level on MCAS, 1998-2002

Mathematics					
Grade	1998	1999	2000	2001	2002
4	11%	12%	12%	10%	12%
6	--	--	--	13%	13%
8	8%	6%	10%	11%	11%
10	7%	9%	15%	18%	20%
English Language Arts					
4	--	--	6%	7%	9%
7	--	--	--	6%	9%
8	3%	3%	5%	8%	--
10	5%	4%	7%	15%	19%

Source: MCAS Statewide Summary, 2001and 2002, Massachusetts Department of Education.

Academic Support grant funds are not to be used for improving the achievement of students who score at the *Proficient* level. Furthermore, the state accountability system neither rewards districts that show progress in accelerating students into the *Proficient* or *Advanced* categories,

nor sanctions districts that fail to raise the numbers of students moving from the *Proficient* to *Advanced* categories. Overall increases in achievement at all MCAS levels are, however, a factor in the state's school recognition program (Compass Schools) and there has been discussion about creating an index of advanced achievement in the future.

Academically Advanced Programs in the Structure of the Department of Education

Although the Department has no separate organizational cluster for academically advanced programs, in 2001 it consolidated initiatives for academically advanced students under the direction of the Center for Teaching and Learning. Five staff members (approximately 2 FTE) handle various aspects of the Department's initiatives in this field on a part-time basis along with other duties.[8]

The consolidation of previously fragmented programs in the Center for Teaching and Learning has had several benefits. First, it has encouraged a PreK-12 approach to research and data analysis (hence the design and content of this study). Second, the collective expertise of staff in the Center in reading, technology, standards and assessment development, teacher quality, licensure, and research has prompted an examination of how academically advanced initiatives might fit in a continuum of the Department's curriculum and instruction initiatives, rather than being piecemeal components of Education Reform.

A Comparison of Funding for Academically Advanced Services in Massachusetts and Other States with Similar Education Reform Initiatives

States have a variety of different ways of financing programs for academically advanced students. The National Association of Gifted Children's Policy Task Force is currently researching the advantages and disadvantages of five of these methods. Of the following, Massachusetts employs only discretionary grants as a source of funding academically advanced services:

> "*weighted funding* (in which) state supplemental aid is allocated on a per-student basis where the amount of aid is based on the funding weight of each student…
>
> *flat grant funding* (that) is based on a fixed funding amount per student and may be allocated either per identified student, or per total student population…
>
> *resource based funding* (that) is based on an allocation of specific education resources, usually teaching staff, but sometimes classroom units…
>
> *percentage reimbursement* (under which) the amount of state supplemental aid a district receives is directly based on its prior year's expenditure in the program…and
>
> *discretionary grants*…rewarded on an application basis… ."[9]

Massachusetts is often cited nationally one of the leaders, along with Florida, Kentucky, North Carolina, and Texas in developing rigorous standards, assessments, and accountability measures. These other states, while facing similar challenges of improving the achievement of low-performing students, also have policies in place that support high achieving students. Many mandate that local districts identify academically advanced students and provide special services for them. In these states, the state department of education often assigns full-time staff to these initiatives and distributes funding on a formula basis. Table 2 on the following page shows the differences among selected states' practices.

Table 2. Selected States' Initiatives for Academically Advanced Education in 1999-2000

Initiatives for academically advanced education	Massachusetts	Florida	Kentucky	North Carolina	Texas
State legislation	Yes	Yes	Yes	Yes	Yes
State mandate	None	Full	Full	Full	Full
State funding	$2.5 million*	Formula	$6.9 million	Formula	$62.5 million plus Formula
Identification of students required by the state	No	Yes	Yes	Yes	Yes
Department of Education staffing for academically advanced education	3.5 FTE°	.95 FTE	Full-time director	Full-time director	Full-time director
Positions requiring endorsement or licensure	None•	Gifted and talented teachers	State director, LEA coordinator	N/A	None

Adapted from *State of the States Gifted and Talented Education Report 1999-2000,* Council of State Directors of Programs for the Gifted and National Association for Gifted Children, 2001.

*In this report, Massachusetts is reported as having $430 thousand in state funds (the Gifted and Talented line item only); the corrected figure above includes funding for Advanced Placement, Advanced Placement Fee Reduction, and dual enrollment programs.

° In 1999-2000, there was a gifted and talented teacher on full-time loan to the Massachusetts Department of Education; 2.5 FTE permanent staff members were assigned to dual enrollment, advanced placement, and Certificate of Mastery programs. The loan position ceased to exist in 2001.

•Licensure regulations were adopted in 2001 for PreK-8 Teacher of the Academically Advanced.

Massachusetts statewide initiatives for academically advanced education include direct services to students, professional development grants, and teacher quality components that are beginning to be coordinated in a systematic way. The bulk of the state's efforts, however, go to remediation services, rather than to improving the academic achievement of all students. There seems to be little commitment among current legislators to fund academically advanced services such as dual enrollment that were conceived as an integral part of Education Reform in 1993.

2. School District Services for Academically Advanced Students in Massachusetts

In the winter and spring of 2002 Department of Education staff, in consultation with members of the Gifted and Talented Advisory Council and the Massachusetts Association for Gifted Education (MAGE), designed and conducted a study of PreK-12 services for academically advanced students. This study consisted of three surveys.

The first survey, requesting information about services for academically advanced students in PreK-5 and grades 6-8, was sent to superintendents of school districts, regional schools, and

heads of charter schools. This survey also included optional questions on the development of a teacher test for the newly-adopted license of PreK-8 Teacher of the Academically Advanced.

The second survey of high school honors courses and Advanced Placement courses was sent to high school guidance counselors in districts, regional schools, and charter schools.

The third survey of current PreK-8 teachers of the academically advanced was sent to respondents of the first survey who indicated that their districts employed full-time or part-time staff specifically to work with academically advanced students. Surveys were also sent to the mailing list provided by MAGE, the state's only professional organization for teachers in this field. The purpose of this survey was to gather information from practitioners about their teaching assignments, graduate and undergraduate degrees, teaching licenses held, and conferences or courses they had found useful for improving their teaching of academically advanced students. This survey also included questions on the development of a teacher test for the newly-adopted license of Teacher of the Academically Advanced.

District PreK-8 surveys were sent to 372 operating districts, also known as local education agencies, or "LEAs". There were 160 responses, 154 reporting on services for academically advanced students at the PreK-5 level, and 157 reporting at the grades 6-8 level, about a 50% return rate at each level.[10] We do not know the status of PreK-8 servicer for academically advanced students in the LEAs that did not return the survey, but it is possible that educators in the LEAs that decided not to respond may have little or no programming for academically advanced students or professional development in this field for teachers.

The survey asked questions about the nature of services, staffing, and professional development. The terms defining program approaches used in the survey were

substantially separate advanced academic program;
advanced academic pull-out program (defined as one that is designed to present content based on the Massachusetts curriculum framework learning standards of a higher grade level);
enrichment pull-out program (defined as one that is designed to extend but not necessarily accelerate learning of content);
differentiated instruction (individualized instruction within a heterogeneous class) ;
other (distance learning, collaboration with community resources, summer or after-school programs or other programming as described by the respondents)..

A. Services for Academically Advanced Students in Grades PreK-8
Table 3 on the following page indicates the services reported by LEAs (about 50% return rate at each level) for academically advanced students in grades PreK-5 and 6-8.

Substantially Separate Advanced Academic Programs
At the PreK-5 level, six LEAs, or 4 percent of those responding to the survey, reported that they maintained substantially separate advanced academic programs taught by designated staff. Three of these are urban districts whose programs serve upper elementary students (Boston: 568 students in grades 4-6, Brockton: 150 students in grades 4-5, and New Bedford: 60 students in grades 4-5). These districts reported that 1 to 2 percent of their PreK-5 students are in these separate classes. Taunton and Longmeadow also reported such programs. In Taunton 24 fifth graders are in a separate program, while in Longmeadow the program was described as serving grades 1-5, but the number of students served was not provided. The Sabis Regional Charter School in Foxboro reported that its entire program for 462 students was advanced.

Nine districts, or 6 percent of LEAs serving grades 6-8 and responding to the survey, reported that they maintained substantially separate advanced academic programs taught by designated staff. Districts reporting these programs are Boston (390 students in grade 6), Brockton (375 students in grades 6-8), Cambridge (134 students in grades 6-8), East Longmeadow (110 students in grades 6-8), Hopedale (149 students in grade 8), Methuen (317 students in grades 6-8), New Bedford (20 students in grade 6), Stoughton (140 students in grades 7 and 8), and Taunton (445 students in grades 6-8).

Table 3. PreK-8 Services for Academically Advanced Students in Massachusetts Public Schools

Survey Component	Grade Levels	Number of LEAs Responding	Percent of responding LEAs reporting services at these grade levels
Totals of districts responding to survey	PreK-5 Grades 6-8	154 157	70% 80%
Districts reporting no current services for academically advanced students	PreK-5 Grades 6-8	48 32	31% 20%
Substantially separate full-day advanced academic programs taught by designated staff	PreK-5 Grades 6-8	6 9	4% 6%
Pull-out advanced academic programs taught by designated staff	PreK-5 Grades 6-8	26 15	17% 10%
Pull-out enrichment programs	PreK-5 Grades 6-8	26 23	17% 15%
Separate accelerated, advanced, or honors academic courses	PreK-5 Grades 6-8	N/A 57	N/A 36%
Differentiated instruction and modification taught by the classroom teacher alone or in combination with other services	PreK-5 Grades 6-8	75 53	49% 34%
Other services (e.g., distance learning, collaboration with community resources, after-school or summer programs)	PreK-5 Grades 6-8	45 38	29% 24%

Source: Massachusetts Department of Education
Number of Responding LEAs: 154 for PreK-5 and 157 for Grades 6-8

Pull-Out Advanced Academic Programs

An "advanced academic program" was defined in the survey as one that is designed to present content based on the Massachusetts curriculum framework learning standards of a higher grade level. These programs are all taught by designated staff, and in many cases exist in combination with other methods. In the districts that responded to the survey, such programs are more likely to be found at the PreK-5 level (17 percent) than at the grades 6-8 level (10 percent).[11] The PreK-5 and the grades 6-8 responding LEAs reporting that they had such services provided a range of 1 to 7 hours of advanced instruction each week, with the majority providing 2.5 hours per week.

Pull-out Enrichment Programs

An "enrichment program" was defined as one that is designed to extend but not necessarily accelerate learning of content taught as part of the regular grade-level curriculum. At the PreK-5 level, 17 percent of the LEAs reported using this approach, nearly the same percentage (15

BEST COPY AVAILABLE

percent) reported for grades 6-8.[12] Used alone or in combination with other methods, these programs are generally taught by staff whose full-time or part-time assignments are to teach enrichment classes. The majority of districts offering such services at PreK-8 provide about 2.5 hours of enrichment each week to students in the programs.

Separate Accelerated, Advanced, or Honors Courses in Grades 6-8

The grades 6 to 8 section of the survey asked about separate accelerated, advanced, or honors courses. (This question was not included in the PreK-5 section of the survey because it is generally in middle school that multiple class sections of different academic levels begin to be offered.) Thirty-six percent of the LEAs responding said that they offered such courses, many indicating that they were predominantly in mathematics.[13] In the past five years the College Board and the Educational Testing System, publisher of the Advanced Placement (AP) tests, has put increasing emphasis on establishing accelerated curricula in the middle grades to accustom students to the academic expectations of AP courses in high school. Some of the separate accelerated, advanced, or honors courses at the grades 6-8 level in Massachusetts may reflect the districts' establishment of coherently articulated sequences of courses beginning in middle school and building to AP courses in grades 11 and 12.

Differentiated Instruction and Modification Taught by the Classroom Teacher

"Differentiating instruction," a term that gained widespread currency in American professional development literature of the 1980s and 1990s, refers to the practice of tailoring lessons to meet the needs of individual students or groups of students of similar ability. The term is applied equally to modifications for students who have difficulty learning and for those who demonstrate unusually high academic or artistic achievement. In the districts that responded to the survey, differentiated instruction is the primary way of serving students with advanced academic achievement in the elementary and middle grades.[14] Nearly half (49 percent) of the LEAs responding reported using differentiated instruction alone or in combination with instruction by specialists or other resources at grades PreK-5 and a little more than a third (34% percent) reported the use of differentiated instruction at grades 6-8 level.

Many school districts assign students of different achievement levels to a single teacher in elementary and middle grades, a policy often referred to as "heterogeneous grouping." Theorists believe that heterogeneous groups provide academic and social benefits for less able students. However, there is no consistent and credible body of research to support these views, and it is not clear that elementary and middle school teachers can teach widely heterogeneous classes without the support of academically advanced teachers to modify curriculum at one end of the spectrum and special education teachers to adapt it at the other end. All districts in Massachusetts must by law have special education teachers but only a few employ specialists in academic advancement. Thus, most elementary and middle school teachers have access to continual support for differentiated instruction for special needs students but are far less likely to have support for their advanced students. In short, while differentiated instruction may sound promising, research is needed on the effect of this practice on advanced students' learning.

Other Services to Academically Advanced Students: Distance Learning, Collaboration with Community Resources, After-School and Summer Programs.

At the PreK-5 level, 45 districts, or 29 percent, reported that they used a variety of models other than the classroom teachers' differentiation of curriculum or teaching by specialists to serve their advanced students.[15] In grades 6-8, 24 percent of the districts reported the use of other services.[16]

These activities ranged from after-school, Saturday, and summer programs, mentoring by professionals from the community, computer investigations and tutorials to partnerships with

colleges, museums, and private schools. The most frequently mentioned approaches were after-school programs, many involving activities such as Destination Imagination, Future Problem Solving, robotics, writing, or the arts. Two of the most popular programs used after school, Destination Imagination and Future Problem Solving, are competitive challenges for teams of students, often led by parent or community volunteers as well as teachers.

Teachers in some districts call upon the expertise of adults in the community and school to mentor students in independent projects of their own choice; some use distance learning such as Educational Program for Gifted Youth (EPGY) math from Stanford University.

Subjects and Grades for which Advanced Instruction is Available

The survey asked respondents to indicate the subjects and grades for which advanced instruction was available. Relatively little advanced instruction appears to be available to very young children. Mathematics and English language arts are the most commonly taught subjects at an advanced level in PreK-8. Advanced instruction in science and history and social science, however, is rare in the elementary grades and rises steadily to its highest elementary school number in grade 5. Foreign languages peak in grades 7 and 8, and "other," which respondents defined as independent study and research as well as the arts, is more common in grades 4 and 5 than in PreK-3 or grades 6-8. Table 4 on the following page gives a distribution by subject area and grades.

Staffing for Services for the Academically Advanced

The total number of full-time teachers of academically advanced students reported for PreK-5 was 92; part-time staff reported was 221. Many districts that serve academically advanced students at the elementary level do so using a combination of full- and part-time staff. It is likely that at least some of the staff counted as part-time are regular classroom teachers who have academically advanced students in their classrooms or those who teach in after-school programs.[17]

Coordination of Programs

Seventy-eight percent of the respondents said that there was no coordinator to oversee services or provide consultation or resources to classroom teachers or parents. Seven percent of the LEAs reported having full-time coordinators, and 16 percent had part-time coordinators. Part-time coordinators are often full-time employees, however; some of these staff teach part-time in the programs they coordinate, others supervise a variety of other programs, such as Title I, and in other districts the coordinator is the assistant superintendent or superintendent.[18]

Table 4. Number of Responding LEAs Offering Academically Advanced Subjects in PreK-8

Subject	PreK-K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Total for the subject
Reading/ English language arts	30	40	45	48	53	46	44	36	39	381
Math	26	28	33	43	52	51	47	57	48	385
Algebra I	N/A	N/A	N/A	N/A	N/A	N/A	3	15	55	73
Science	10	9	13	18	26	33	20	24	24	177
History and social science	9	9	12	18	23	28	16	20	20	155
Foreign Language	6	6	8	10	10	8	9	16	20	93
Arts	1	1	1	1	0	1	1	0	0	6
Independent. Research on topics of interest, Problem Solving	1	2	2	3	7	6	5	5	5	36
Totals by grade	83	95	114	141	171	173	145	173	211	1306

Source: Massachusetts Department of Education
160 LEAs reporting

Percentages and Numbers of Students Served

The United States Department of Education and the National Association for Gifted Children estimate that 5% of the general population are gifted and an additional 3% are academically talented. The Massachusetts survey asked for the total number of PreK-5 and grades 6-8 students in the district or school, and the number that received some sort of academically advanced services.

Only about half of the districts responding to the survey provided this information in full, even when they reported providing services, so the totals reported (10,707 at PreK-5 and 12,282 at grades 6-8) are probably lower than the actual numbers served. Nonetheless, it is interesting to note that the numbers reported, as percentages of the total number of students at those grade levels in reporting districts, fall close to the federal guidelines: 4% at the PreK-5 level, and 8% at the grade 6-8 level.[19]

Those districts that *did* provide numbers for PreK-5 showed a wide range in the percentage of students for whom academically advanced services are provided. Percentages of students served ranged from 1% to 86%, with the majority falling in the 7% to 20% range. Districts reporting percentages above 20% indicated that they sought to find the areas of high ability and interest for all children, and the number of participants fluctuated during the year depending on the nature of the projects. In general, suburban districts were more likely than urban districts to include a larger percentage of students. Seven of the urban districts that provided information on the numbers of students involved served less than 1% to 2% of the students in PreK-5 (Boston, Brockton, Chelsea, Fall River, Fitchburg, Lowell, New Bedford). Worcester and Framingham reported serving 5% and 6% respectively. (Haverhill and Lawrence responded to the survey but did not provide did not provide figures.)

At the grade 6-8 level, the range of percentages reported was .5% to 100%, with the majority falling into the 5% to 20% range. The urban districts tended to report higher percentages of students served at the middle than the elementary level (Boston 3%, Brockton 8%, Chelsea 14%, Fall River 14%, Framingham 10%, Haverhill 21%) with the exception of Worcester (1%) and New Bedford (.5%). Fitchburg, Lawrence, and Lowell did not supply middle school figures.

It is clear from the range of percentages reported that districts and schools in Massachusetts use many and varied working definitions of what the terms "academically advanced" or "gifted and talented" mean. Not surprisingly, LEAs that employed a coordinator or designated teachers tended to provide more precise enrollment figures. They also tended to report lower percentages, suggesting that they are more likely to use more formal procedures for identifying students to participate in academically advanced programs.

Selection of Students

At both the PreK-5 and 6-8 level, the most common way of selecting students for participation in academically advanced programs was through teacher recommendations coupled with a review of student grades or collections of student work. Approximately a third of the districts reported using diagnostic assessments, including: aptitude testing, test of cognitive skills, Differentiated Matrix, Torrance Test, reading tests, Raven's Progressive Matrix, Naglieri Nonverbal assessment, IQ tests, Renzulli scales, SAGES, I, Education Program for Gifted Youth (EPGY), Metropolitan Writing, Orleans Hanna Math Test and school-developed assessments, including writing samples.

Professional Development: Pedagogy and Content

Approximately 40 percent of the LEAS that returned the survey reported that they provided no training for PreK-8 teachers in the field of academically advanced education. Of the districts that did provide professional development, about two-thirds provided professional development for classroom teachers in the pedagogical techniques and philosophy of differentiated instruction, curriculum design, brain research, and theories about learning.[20] (It is no coincidence, then, that differentiation of curriculum by classroom teachers was also the most common way reported of providing services to academically advanced students.)

Differentiated instruction for academically advanced students relies on the teacher's skill at designing instruction to meet the individual needs of high achieving students. Success in working with these students also requires a firm grasp of academic content. We do not know from the survey how content-specific or linked to standards the sessions on differentiated instruction were or whether they had a substantial component about teaching academic content to advanced students.

Only about 15 percent of the PreK-8 respondents said that they had provided professional development in an academic content area. Ten reported sessions in English language arts, three in math, seven in science, one music, and one social studies. We do not know the extent to which the teachers in the reporting districts participate in professional learning in the content areas. Nonetheless, in the survey responses advanced coursework in academic disciplines is not frequently mentioned as a component of training teachers to work with high-achieving students. Thus, survey results suggest that teachers are trained to differentiate instruction generically but are not necessarily educated in advanced academic content. It is open to question, therefore, how well these teachers can serve students who have already mastered grade-level content.[21]

Summary of Findings from the PreK-8 Survey

The survey responses revealed seven broad trends in district approaches to academically advanced education in the elementary and middle grades.

- Academically advanced students in PreK-5 are more likely to be taught by elementary classroom teachers with some training in individualizing or "differentiating" instruction than by specialists in content or in gifted education.

- When advanced instruction is provided, it is more likely to be available in the upper elementary and middle school grades than in the primary grades.

- Academically advanced students in grades 6-8 are just about as likely to receive advanced instruction through differentiated classroom instruction as through separate advanced or accelerated courses.

- Students may receive no advanced instruction whatsoever in a third of the elementary schools and in a fifth of the middle schools.

- The subject matter priorities in advanced instruction mirror the subject priorities of the regular PreK-8 classroom. Students are more likely to receive advanced instruction in reading and mathematics than in other subjects in PreK-8. They are also more likely to receive advanced instruction in science and history/social science in grades 4 and 5 than middle school. It is relatively rare that they receive advanced instruction in foreign languages and rarer still that they receive advanced instruction in the arts.

• Children in suburban and rural districts appear to be far more likely to receive academically advanced services than their peers in urban schools. On the other hand, children in urban districts who *do* receive academically advanced instruction are more likely to receive intensive, substantially separate instruction than students in suburban and rural schools.

• Professional development in academically advanced education is more likely to focus on pedagogical technique and theory than on advanced academic content.

B. Services for Academically Advanced Students in Grades 9-12

We sent the second survey, which asked about advanced, honors, and Advanced Placement courses, to the 272 LEAs that offer instruction in grades 9-12. We received responses from153 individual high schools, representing 139 LEAs. This is about a 50% response rate, similar to that for the PreK-8 survey.[22] These responding districts offer 2,514 advanced or honors courses and 1,096 Advanced Placement courses. We have no information about the specific content of courses the districts reported as advanced or honors, nor whether the schools consider these courses prerequisites to AP courses.

Table 5. Number of Advanced, Honors, and AP Classes Offered in Responding Schools[23]

Grade	English	Math	Science	History/ Social Science	Foreign Language	Arts (Music, Dance, Theatre, Visual Art)	Total for Grade Level; Total AP
Grade 9	128	124	114	112	73	27	578
Grade 10	131	129	122	118	95	41	636
Grade 11	129	139	128	117	109	45	667
Grade 12	117	126	119	96	117	58	633
AP courses	146	184	308	213	161	84	1,096
Total for subject	651	702	791	656	555	255	3,610

Source: Massachusetts Department of Education, 153 high schools in 139 LEAs reporting

The breakdown of specific AP courses is listed below.

1. Arts
   Art History 3 Studio Art 58 Music Theory 23
2. English Language Arts
   English Language and Composition 44 English Literature and Composition 102
3. Foreign Languages
   French Language 49 French Literature 6 German Language 8
   Latin 4 Latin: Vergil 9 Latin Literature 7
   Spanish Language 71 Spanish Literature 7
4. History and Social Sciences
   Economics: Microeconomics 9 Macroeconomics 8
   Government and Politics: Comparative 6 United States 18
   History: European 50 United States 107 World 8
   Human Geography 3 Psychology 4
5. Mathematics
   Calculus AB 112 Calculus BC 35 Statistics 37

6. Science

Biology 98 Chemistry 69 Physics B 51 Physics C 22
Computer Science A 27 Computer Science AB 23 Environmental Science 18

Dual Enrollment

The Dual Enrollment Program was created by the Massachusetts Education Reform Act of 1993, became available to students in 1995, and was suspended in the winter of 2002. Through the Dual Enrollment program, high school juniors or seniors with an average of B or better enrolled in courses at the Commonwealth's twenty-seven public universities, colleges, and community colleges. Its programs were designed to: (a) give students access to advanced courses that are not available on their high school campuses; (b) introduce students to the rigors of college-level study in a college setting; and (c) enable students to receive college credit for work accomplished before formal college admission.

The following are examples of the kinds of courses students chose to take:
Introduction to Engineering, Chinese, Calculus 2, Psychology, Sociology, Theater Arts, Computer Programming, Russian, Greek, History of the Civil Rights Movement, History of the Middle East Poets of New England, Film, Video, and Society, Color and Design, Conceptual Physics, Women's Studies, Political Science, Philosophy, and Linguistics.

Since the fall of 1999, about 2000 students from Massachusetts' public high schools, vocational-technical schools, charter schools, alternative programs, special education collaboratives and private high schools have participated each semester. In the spring 2001 semester (the last semester for which the Department has statistics), juniors and seniors from 63 percent of the public high schools participated in Dual Enrollment. In that same semester, students from eighteen vocational technical schools, eight special education schools, seventeen private and parochial high schools, five charter schools, and six alternative schools participated in the Dual Enrollment Program. Most students took one or two courses; however, a small percentage (less than 10%) took all their courses at the college or university.

Beginning in fall 1999, two additional Dual Enrollment program were created: (1) the Alternative Dual Enrollment Program (DESAEP) and (2) the Dual Enrollment/Distance Education ("DE Squared") Pilot. The Legislative appropriation had increased to 1.78 million and approximately 2,000 students were participating each semester. Through the Alternative Dual Enrollment Program (DESAEP), students in alternative high school programs may enroll in higher education courses with the recommendation of their teachers and guidance counselors. A limited synchronous distance education pilot in FY 2001 enabled students to participate in college courses from their high school classrooms.

The Alternative Dual Enrollment Program served students in alternative education programs. Unlike the regular Dual Enrollment Program, DESAEP students did not need a 3.0 grade point average to be eligible; they only needed the recommendation of their advisor that they were capable of doing college level work. The reason for waiving the 3.0 GPA requirement was not to penalize students who "turned their lives around" around and were now succeeding academically.

The "DE Squared" pilot study was undertaken to determine whether distance education could serve the needs of students who are unable to participate in the Dual Enrollment program either because they work after school or take part in athletics, or because they simply lack transportation. The "DE Squared" pilot study examined the feasibility of bringing college courses to the high school via synchronous two-way audio-visual distance learning. At three of the four high school sites that were studied, synchronous distance learning proved to be an effective means of bringing

BEST COPY AVAILABLE

rigorous college level work to high school students who would otherwise not have been able take advanced courses in mathematics and science.

In FY 02, the Dual Enrollment and Alternative Dual Enrollment Programs were cancelled for the spring semester as a result of the Commonwealth's budget crisis. The Department of Education requested $1.78 million for these programs in the FY 03 budget, but as of June 2002 neither the Governor's budget nor the House or Senate budgets have recommended funding for 2003.

The Stanley Z. Koplik Certificate of Mastery

The Stanley Z. Koplik Certificate of Mastery Program was created under the Massachusetts Education Reform Act of 1993, and became available to students in 2000. Since then 3,019 high school students have received this recognition of high academic achievement. Students who receive the Certificate of Mastery must receive at least one score of *Advanced* and another *Advanced* or *Proficient* in the grade 10 English language arts and mathematics portions of the Massachusetts Comprehensive Assessment System. They must also list other achievements, such as passing Advanced Placement, SAT II, or college courses, or receiving an award in a juried academic or artistic competition. Many students have listed college courses taken in the Dual Enrollment program to qualify for the Certificate of Mastery.

In addition to public recognition of the student's academic achievement in high school, the Certificate of Mastery carries with it the financial benefit of a waiver for the tuition fees at Massachusetts state colleges and universities. A student must continue to maintain a B average in college in order to continue to receive the tuition waiver for the four years of undergraduate work.

In 2000 (the first year of the award): 860 students received the award. All were from the class of 2000. In 2001, 1,859 students from 214 schools received the award. Of that total, 1,038 recipients are from of the class of 2002, 816 are members of the class of 2001, and 5 are from the class of 2000. In 2002, approximately 400 students had received the award by mid-June, about halfway through the application period. [24]

High School Summary

Honors, advanced, and Advanced Placement courses are offered in all the core academic subjects in Massachusetts high schools. Courses in mathematics and the sciences are more common than those in the humanities, foreign languages, and the arts. Beginning in the mid-1990s, the opportunities for high school students to take Advanced Placement and college courses expanded, and the Certificate of Mastery Program provided an incentive for students to score high on MCAS in order to receive scholarships to state colleges and universities.

C. Teachers of Academically Advanced Students

Although Massachusetts districts clearly have staff teaching in PreK-8 programs for academically advanced students, there was no specific license for these teachers until 2001and no approved programs in the state preparing teachers for this responsibility. A new teacher test will be developed for this license in FY03, and we took advantage of the survey to gain information about the academic backgrounds, certification levels, and teaching assignments of these educators, and the kinds of professional development they had found most useful to their work.

We received responses from 66 PreK-8 teachers in 31 public school districts and two independent schools, one of which runs a Saturday school program for public school students.[25] Some teach academically advanced students full time, others for a few as 3 hours per week. Their undergraduate academic preparation tends to be in either the humanities or education, and their graduate work is largely in education.

Twenty-three have bachelor's degrees in education, usually elementary education with a minor in another academic discipline. Thirty-two hold undergraduate degrees in a humanities discipline: seven in English, seven in history, five in psychology or sociology, two in visual art, two in theatre, and one each in German, Russian classical studies, theatre, economics, political science, theology, and philosophy. Six hold undergraduate degrees in mathematics or science: two in mathematics and one each in biochemistry, chemistry, and marine biology.[26] Eighty-five percent of those responding hold master's degrees, primarily in education (including reading) or psychology. There are also three in history, two in theatre, one in health, and one in biology. Three hold doctorates, and two hold law degrees.

The 66 teachers reported that they held a total of 98 licenses, a range of one to five per teacher. The majority of licenses held are not subject specific, and a third of the teachers responding hold only one license, in elementary education. Twenty-eight percent of the licenses held are in a humanities discipline and 19% are in mathematics or one of the sciences.

Table 6. Licenses held by teachers of PreK-8 academically advanced students

License	Number
Total Number of non subject-specific licenses	52
Elementary education	36
Special education	5
Middle school general	5
Guidance	3
Audio-visual specialist	1
Principal	1
Supervisor/Director	1
Total number of humanities licenses, 5-9, 5-12 or K-12	27
English	9
Social Studies	7
History	5
Theatre	2
Geography	1
Reading	1
Speech	1
Visual Art	1
Total number of mathematics and science licenses, 5-9 or 9-12	19
Mathematics	9
Science	3
Biology	3
Chemistry	2
Earth Science	2

Given the diversity of these teachers' degrees and teaching licenses, their responses to the question about which courses or professional development they found most useful were surprisingly consistent. Nearly all of them cited "Confratute," the Center for Gifted Education's annual summer conference/institute at the University of Connecticut. It is apparent that many return to it year after year for professional development and probably to maintain connections with their peers in the same field. The New England Regional Conference for Gifted and Talented was also frequently mentioned, as well as workshops of shorter duration on topics having to do with theory

and practice in gifted education. A few mentioned content workshops, primarily in math or literature.

Teachers' Recommendations for Teacher Preparation and the Teacher Test

The Department of Education has established a new license for PreK-8 Teacher of the Academically Advanced in mathematics and science or in the humanities. There are currently no educator preparation programs in Massachusetts to provide courses for teachers who wish to get this license, although at least one college has expressed interest in developing a program.

Questions on the survey asked what academic preparation prospective teachers of the academically advanced should have in three areas: knowledge of curriculum and standards in general, knowledge of math and science (for the math/science license), and knowledge of the humanities (for the humanities license). Respondents were unanimous in advising that there should be *both* thorough preparation in the academic content of the license and in the theory and practice of academically advanced education, and that both of these areas should be reflected in the teacher test.

When asked what teachers should know about curriculum and standards in general, the majority said that teachers should have general knowledge of all the Massachusetts Curriculum Frameworks at several grade levels above the grade level they would teach. They said there should be courses to introduce the content in the frameworks, and coursework on developing enrichments and individualized lessons for advanced students linked to the standards.

Regarding content knowledge, the strongest recommendation was that candidates have at least a bachelor's degree in mathematics, one of the sciences, or a humanities discipline if not a master's degree in one of these disciplines. They said the candidate should have experience teaching in one of these subjects, and familiarity with research-based strategies for teaching in the discipline. Several said practica or apprenticeships with certified teachers of mathematics, science, or a humanities discipline would be helpful. In discussing what academic content the teacher test should cover, respondents in general said it should include college-level concepts and knowledge that one would learn in a "well-rounded liberal arts" program," and one mentioned the ability to cite authorities in the subject area of the license. One person said simply knowledge of "the content expected on MCAS at an advanced level."

The teachers provided the lengthiest responses to the final survey question "What knowledge of curricular and instructional strategies for academically advanced students should the test for this license assess?" Their list, in order of frequency of responses, contained the following: instructional strategies for teaching academically advanced students; theories of gifted education and work of experts in field; social and emotional characteristics of advanced student; theories of development, learning, and intelligence; research topics such as underachievement, academically advanced/special education, culturally diverse academically advanced students, gender differences in academically advanced education, research in academically advanced education; assessment and identification; acceleration of curriculum; integration of content; and creativity.

Summary

Statewide Services

Under Education Reform, Massachusetts has in place important elements, such challenging standards and assessments, strengthened teacher licensing, and an accountability system, that could support a coherent and well-articulated program of services for academically advanced students. Yet in the last five years the state has concentrated its resources on remedial services and has spent less than .1 percent of state education funding on services for academically advanced

students. As education spending grew in 1990s, funding for academically advanced education grew modestly at the state and local levels. As resources decline at the state and local levels, so do services for the academically advanced. The recent dismantling of the $1.8 million dual enrollment program and the lack of state funding in FY03 for Advanced Placement grants indicate that support for this area is marginal in times of economic austerity. State support for academically advanced students in FY03 is projected to be 15% of what it was in FY01.

District Services for PreK-12 Students

The education of high-achieving students does not appear to be a priority in most districts. In our survey, only half of the PreK-8 districts responding reported services for advanced students, and only about a quarter of these had staff designated to teach and coordinate these programs. Academically advanced students in PreK-2 – those who can read and perform mathematics operations far beyond their peers – receive the fewest services. Students in urban schools - including large numbers of students speaking languages other than English, minority students, and students from low-income families - are far less likely to receive advanced instruction than are suburban or rural students. Finally, advanced students at the middle school level are as likely to be taught in a heterogeneous classroom by a teacher trained in differentiated instruction as they are to be taught in an advanced subject matter class (see Table 3). If they are taught in an advanced class in middle school, the subject is more likely to be mathematics than other subjects (see Table 4). At the high school level the picture is somewhat brighter: advanced classes appear to be widely available and there is a growing number of Advanced Placement classes. It is not clear, however, that there an that there is an equal number of honors or advanced courses available to students before they can or do take AP courses.

Teacher Quality

The survey of current PreK-8 teachers of the academically advanced revealed that the vast majority hold undergraduate degrees in humanities disciplines or in education and that very few have degrees in mathematics or the sciences. Although teachers of the academically advanced are extremely resourceful in drawing on the strengths of the community to meet their students' needs, the survey data suggest that many may not be strongly equipped to serve the child who is mathematically, scientifically, or artistically advanced.

Recommendations

Statewide Initiatives

The Center for Teaching and Learning should continue to develop and coordinate department policies and efforts in academically advanced education. While the Center lacks the personnel to pursue these efforts in FY03, when adequate staff becomes available, possible projects could include:

- seeking federal or foundation funding to support elementary and middle school programs and high school dual enrollment;

- establishing an index of advanced achievement as part of its accountability system and implement procedures that recognize districts for increasing the number of students scoring in the *Advanced* category over time;

- incorporating measures of progress by academically advanced students into its initiatives in reading, mathematics, and instructional technology;

- encouraging the establishment of International Baccalaureate programs and continuing to support existing advanced, honors, and AP courses at the high school level;

• encouraging the expansion of the number of accelerated courses, especially in mathematics, at the middle and high school level;

• conducting research on the relationship between participation in honors, advanced, or accelerated classes in middle and high school and *Advanced* scores on MCAS in grades 8 and 10

Leadership for District Services

The Massachusetts Legislature's appropriation for PreK-8 academically advanced services has never been greater than $480,000 per year, and was eliminated entirely in FY03. The total amount of the appropriation had to be distributed to school districts and could not be used to support a staff position at the Department of Education. In the past it has supported modest professional development at the district level, but was not enough to provide for direct services to students. The Department of Education should use the data from its 2002 surveys to shape grant priorities when and if funding for academically advanced education is reinstated. In particular, it should focus these areas:

• identifying PreK-2 students who are advanced in mathematics and English language arts and the development and publication of model curricula in these subjects based on Massachusetts curriculum framework standards for grades 3 and above;

• providing professional development for PreK-5 teachers of the academically advanced based on the academic content in standards for grades 6 through high school;

• disseminating research about coherent articulated PreK-12 approaches to teaching advanced students and strategies to bring about high academic achievement by English language learners and other students in high poverty schools.

At the high school level, the Department has used funds appropriated by the Legislature, combined with funding from competitive federal grants, to support the expansion of Advanced Placement courses, the training of teachers to teach AP classes, the reduction of fees for AP exams paid by low-income AP students, and the development of challenging middle school courses preparing students to succeed in AP work in the high school. In the future, the Department could make the expansion of accelerated middle and high school courses, particularly in mathematics, science, and foreign languages, a priority in its grants to districts. In its July 2002 application for three years of federal funding under the Advanced Placement Incentive Program, the Department proposed to concentrate on funding AP initiatives in the thirteen districts in which the student population has at least 40% of the students living in high low-income households. This proposal centers around strengthening the grades 5-10 curriculum, and improving the qualifications of middle and high school teachers, so that students in the final years of high school are prepared to enroll in AP courses, take the exams, and pass them with a score of 3 or better.

Teacher Quality

The Department should support programs to prepare prospective teachers to work with academically advanced students as well as professional development to increase current teachers' content knowledge, curriculum design expertise and familiarity with the cognitive and social needs of advanced students. It should focus on these areas:

• developing educator preparation programs leading to licensure as a K-8 Teacher of the Academically Advanced in math/science or humanities;

• using the expertise of current Massachusetts teachers of academically advanced students to review teacher tests for the license of K-8 Teacher of the Academically Advanced in mathematics/science and humanities.

• providing PreK-8 content institutes that develop teachers' knowledge of academic content and that help them develop model curricula in mathematics, science, and the humanities for advanced students.

---

[1] In 1997, the last year for which national data are available from the federal government, the National Center for Education Statistics reported that 32 states had state-mandated gifted and talented programs in the 1995-96 school year and that 16 states, including Massachusetts, had discretionary state-supported gifted and talented programs. (Digest of Education Statistics, 1997/Chapter 2 – Elementary and Secondary Education/Table 54.) This table is repeated in the 2000 Digest.

[2] Massachusetts Board of Education 2001 Annual Report, Appendix B. Massachusetts Department of Education, March 2002.

[3] Higher figures reflect initial program appropriations in the Massachusetts House budget in FY02. The Board of Higher Education managed the Dual Enrollment program in its first two years' of existence, from 1995 through 1996. The Legislature's annual appropriation was 1 million dollars. In 1997, the responsibility for the management of the program was transferred to the Department of Education. In 1998, the legislature increased the program's appropriation from 1 million to 1.5 million, then to $1,779,400 by 2001.

State tax revenues fell sharply following the September 11, 2001 terrorist attack, resulting in final budget cuts in many state accounts for education and other services. In the final FY02 budget signed by the Governor in November 2002, funding for the Dual Enrollment program was reduced to $343,641, the Gifted and Talented account to $370,745, and the Advanced Placement account to $462,400. The Department of Education's budget request for FY03 included a line item of $1,779,400 for Dual Enrollment, and a line item of $1,000,000 for Academically Advanced Programs, combining the previous Gifted and Talented Education and Advanced Placement line items. None of these programs were recommended for funding in the final FY03 budget signed by the Governor.

The Board of Higher Education managed the Dual Enrollment program in its first two years' of existence, from 1995 through 1996. The Legislature's annual appropriation was 1 million dollars. In 1997, the responsibility for the management of the program was transferred to the Department of Education. In 1998, the legislature increased the program's appropriation from $1 million to $1.5 million.

[4] Massachusetts Board of Education 2001 Annual Report, page 22.

[5] This amount is in addition to the funding for special education or Title I.

[6] It should be noted that MCAS assessments are not designed to identify academically advanced students, and the Department has not conducted research on the relationship between high achievement on MCAS and enrollment in gifted and talented programs. Nonetheless, it seems reasonable to expect that some students scoring at the *Advanced* level are, in fact, those identified in the districts to be in gifted and talented programs, honors, or accelerated courses.

[7] See the Executive Summary of the 2001 MCAS State Results, Massachusetts Department of Education, 2001, http://www.doe.mass.edu/mcas/2001/results/statesum2.html In explaining the reporting of grade 4 English language arts results in 2000 and 2001, this report notes that:
"In response to widespread concerns about the 1998 performance level thresholds on the grade 4 English Language Arts test, the Department of Education undertook a review of the grade 4 MCAS English Language Arts test and its performance standards. The process included an examination of: (a) the

alignment of the fourth grade test's reading passages and items with the English Language Arts *Curriculum Framework*; (b) the performance level definitions; and (c) the standard-setting process.

In August 2001, a new standard setting panel was convened for grade 4 English Language Arts. The 2001 MCAS grade 4 ELA test results are based on the new set of performance standards recommended by that panel. Because of the change in performance standards, the 2001 grade 4 English Language Arts test results are not directly comparable with grade 4 ELA MCAS test results reported from 1998 through 2000. However, to enable the monitoring of progress, the 2000 grade 4 English Language Arts MCAS test results are reported herein according to the newly-established performance standards."

In 2001, a grade 7 English language arts assessment was given along with a grade 8 test; in 2002, the grade 8 English language arts test was suspended. In that year, a grade 6 mathematics assessment also began.

[8] Prior to 2001 the Office of Special Services (special education) managed Gifted and Talented grants, while Learning Support Services and the Office of Student Learning managed AP, dual enrollment and the Certificate of Mastery initiatives.

[9] From a survey conducted by the National Association of Gifted Children, May 2002. The definitions are credited to Bruce D. Baker of the University of Kansas, *Policy Brief on State Funding for Programs for the Gifted and Talented,* (Draft) February 2002.

[10] Three respondents kindly noted that theirs was a grade 9-12 district, therefore the survey was not applicable to them.

[11] Districts reporting PreK-5 pull-out advanced academic programs alone or in combination with other methods, were:
Barnstable and Barnstable Horace Mann Charter School (grades 2-5: English language arts/reading, math, science, history and social science, foreign languages),
Bedford (grades K-5: English language arts/reading, math, science, history and social science),
Brookline (grades PreK-5: English language arts/reading, math, science, history and social science),
Canton (grades 3-5 science and history and social science),
East Longmeadow (grades 1-5: English language arts/reading, math, science, history and social science, foreign languages, art, music),
Edgartown (grades 2-8, math, English language arts, interdisciplinary),
Framingham (grades 1-5, interdisciplinary),
Hingham (grade 3 reading, grades 4-5 math), Leicester (grades K-2 reading, math, science, foreign languages), (grades 2-8 computer),
Methuen (grade 5: : English language arts/reading, math, science, history and social science, foreign languages, creative problem-solving)
Millis (grades 1-4: reading/English language arts);
Norwood (grade 1, no details);
Palmer (grade 4: math);
Plymouth (grades 4-6: English language arts/reading, math, science, history and social science),
South Boston Harbor Academy Charter School (grade 5, English language arts and math),
Tantasqua Regional: Sturbridge elementary (grade 5: English language arts/reading, math, science, history and social science),
Tewksbury (grades 3-4: English language arts and math),
Tisbury (grades 2-8, by computer),
West Boylston (grades 3-5 multidisciplinary),
Worcester (grades 4-6, regular and bilingual programs: English language arts/reading, math, science, history and social science).

Districts reporting pull-out academic programs at the grades 6-8 level were: Arlington, Barnstable, Barnstable Horace Mann Charter School, Brookline, Clinton, East Longmeadow, Edgartown, Framingham, Gateway Regional, Haverhill, Hingham, Methuen, and Plymouth.

[12] LEAs reporting pull-out enrichment programs, alone or in combination with other methods in PreK-5, were: Arlington, Barnstable, Barnstable Horace Mann Charter School, Bedford, Berlin, Beverly, Blackstone-Millville, Boylston, Bridgewater-Raynham, Brookline, Chelsea, Dedham, East Longmeadow, Edgartown, Falmouth, Framingham, Halifax, Hingham, Medfield, Methuen, North Middlesex, Norton, Palmer, Peabody, Somerset, Tewksbury, Tyngsborough, Watertown, West Boylston, Westborough, Whitman-Hanson, Worcester.

LEAs reporting enrichment programs at grades 6-8 were: Arlington, Barnstable and Barnstable Horace Mann Charter School, Berlin, Brookline, Burlington, Canton, Chelsea, Clinton, East Longmeadow, Edgartown, Falmouth, Framingham, Halifax, Marlborough, Medfield, Methuen, North Middlesex Regional, Norton, Norwood, Somerset, Seven Hills Charter School, Stoughton, Taunton, Tantasqua, Westborough, and Whitman-Hanson.

[13] LEAs reporting separate accelerated, advanced or honors courses in grades 6-8 were: Barnstable, Barnstable Horace Mann Charter School, Beverly, Brockton, Burlington, Carlisle, Clinton, Concord, Dartmouth, Dedham, East Longmeadow, Easton, Fall River, Falmouth, Foxboro, Franklin, Granby, Hamilton-Wenham, Hampden-Wilbraham, Hanover, Hingham, Holliston, Hopedale, Hopkinton, King Philip Regional, Longmeadow, Medfield, Medford, Methuen, Middleborough, Millbury, Millis, Mount Greylock, Nashoba Regional, Newton, North Middlesex Regional, Northampton, Norwood, Peabody, Plymouth, Richmond, Rockland, Sandwich, Saugus, Scituate, Somerset, Southern Berkshire, Stoughton, Taunton, Triton Regional, Tyngsborough, Wareham, West Boylston, West Springfield, Westborough, Westfield, Westford, and Westwood.

[14] LEAs reporting the use of curriculum differentiation and modification by PreK-5 classroom teachers to meet, wholly or in part, the needs of academically advanced students were: Abby Kelley Foster Charter School, Acton, Arlington, Ashland, Bedford, Blackstone-Millville, Boxborough, Berlin, Boylston, Brewster, Bridgewater-Raynham, Brookline, Chelsea, Concord, Dartmouth, Dedham, Duxbury, East Longmeadow, Easton, Edgartown, Falmouth, Foxboro, Franklin, Gardner, Gateway Regional, Granby, Groton-Dunstable, Hamilton-Wenham, Haverhill, Hingham, Holliston, Hopkinton, Lawrence, Leicester, Littleton, Longmeadow, Lowell, Lowell Community Charter School, Medfield, Medford, Mendon-Upton Regional, Methuen, Millbury, Nashoba Regional, Needham, Neighborhood House Charter School, New Bedford, Newton, North Middlesex Regional, Oak Bluffs, Pentucket Regional, Plymouth, Randolph, Reading, Rockland, Salem, Shrewsbury, South Boston Harbor Charter School, Southern Berkshire Regional, Stoughton, Sudbury, Tewksbury, Triton Regional, Up-Island Regional, Waltham, Wareham, Watertown, Wayland, Wellfleet, Westborough, Westford, Westwood, Weymouth, Whitman-Hanson, and Wrentham.

LEAs reporting curriculum differentiation in grades 6-8 were: Abby Kelley Foster Charter school, Academy of the Pacific Rim Charter School, Acton, Brookline, Ashland, Beverly, Boxborough, Boylston, Canton, Chelsea, Concord, Dedham, Duxbury, East Longmeadow, Easton, Edgartown, Fairhaven, Framingham, Franklin, Gill-Montague, Groton-Dunstable, Hamilton-Wenham, Haverhill, Hingham, Holliston, Lawrence, Medfield, Medford, Mendon-Upton, Methuen, Mount Greylock, Needham, Neighborhood House Charter Schools, Newton, North Middlesex Regional, Oak Bluffs, Pentucket Regional, Plymouth, Randolph, Reading, Rockland, Salem, Southern Berkshire, Seven Hills Charter School, Shrewsbury, Stoughton, Sudbury, Taunton, Up Island Regional, Triton, Waltham Wareham, Watertown, Wayland, Westborough, Westwood, Weymouth, Whitman-Hanson, Worcester, and Wrentham.

[15] LEAs reporting the use of community resources, distance learning, after-school, Saturday or summer programs at PreK-5, either alone or in combination with other services were
Acton (small number of children permitted to enter Kindergarten or grade 1 early; advanced enrichment by faculty who choose to do so on an occasional basis),

BEST COPY AVAILABLE

Barnstable and Barnstable Horace Mann Charter School (EPGY* , after school Destination Imagination, robotics, mentorships, community service learning),
Bedford (visits from "experts in the field" who mentor independent study),
Blackstone-Millville (after-school program)
Boston (summer and Saturday math and English language arts),
Boston Renaissance Charter School (ability groupings for reading),
Bridgewater-Raynham (after-school program for grade 5),
Canton (Future Problem Solving),
Chelsea (after-school program),
Danvers (after-school program – Destination Imagination),
Dartmouth (Destination Imagination)
Dedham (Destination Imagination)
Dracut (after-school enrichment),
East Longmeadow (no details given),
Edgartown (EPGY, math in multimedia computer program, Creative Problem-Solving in the Classroom applied to Curriculum Framework topics, literature groups, independent research, Weathernet and Science Museum Weather Project, Future Problem-Solving, creative writing, and community problem-solving
Fall River (after-school reading and math for grades 3-5)
Falmouth (mentoring for talented and motivated students),
Fitchburg (Destination Imagination)
Framingham (consultant-teacher and resource model focusing on self-help and differentiated instruction)
Gill-Montague (after-school program, grades 3-6),
Framingham (consultant/teacher and resource model focusing on self-help for the student and differentiated instruction),
Groton-Dunstable (after-school enrichment K-5 taught as two 6-week programs),
Hanover (after-school program), Hingham (after-school program, Milton Academy Saturday program)
Holliston (independent research using Internet),
Hopedale (Destination Imagination), Lawrence (summer academy with Northern Essex Community College beginning in grade 5
Lawrence (partnership with Northern Essex Community College to provide a simulated college experience with instructional technology component in a summer academy and weekend programs for students and their families in grades 3-8)
Leicester (after-school program)
Longmeadow (after-school writer's workshop, art workshop, keyboarding, science)
Marshfield (after-school enrichment program),
Medford (no details),
Mendon-Upton (Destination Imagination),
Methuen (no details),
Nashoba Regional (after-school program, Destination Imagination)
Norwood (no details),
Orange (after-school and summer programs),
Pentucket Regional (Destination Imagination, after-school enrichment),
Plymouth (Destination Imagination, robotics, Future Problem Solving, CTY)
Somerset (after-school arts program), Tewksbury (after-school enrichment),
Tisbury (EPGY* math, Future Problem-Solving, after-school program)
Triton Regional (after-school program, collaboration with community resources),
Wareham (enrichment units by mentors),
Westborough (after-school program K-3),
Westwood (after-school enrichment, including foreign languages)
Wrentham (classroom enrichment, Talents Unlimited model for grades 3-6. Math curriculum compacting advanced literature and reading programs, enrichment library, and after-school program, Destination Imagination).

*EPGY: Education Program for Gifted Youth, a distance learning project of Stanford University)

[16]LEAs reporting "other services" at the grade 6-8 level were:
Barnstable and Barnstable Horace Mann Charter School (curriculum compacting, robotics, Future Problem Solving, mock trial, summer math and science academy, summer wetlands program, EPGY, New England Math League, mentors for math, creative writing and art, the stock market game, study of Ecuador and the rain forest, Destination Imagination, participation in math, poetry and essay contests, History Day, and the Geography Bee)
Blackstone-Millville (after-school program)
Boston Renaissance Charter School (ability groupings for reading)
Canton (Future Problem Solving),
Chelsea (after-school program),
Dartmouth (Destination Imagination)
Dracut (after-school enrichment),
East Longmeadow (Creative and Critical Challenges Program),
Edgartown (EPGY, math in multimedia computer program, Creative Problem-Solving in the Classroom applied to Curriculum Framework topics, literature groups, independent research: Independent Investigation Model, mentorships, minicourses taught by community volunteers, Weathernet and Science Museum Weather Project, Future Problem-Solving, Edgartown Readers book discussion group, writing group
Fall River (after-school reading and math for grades 3-5)
Falmouth (mentoring for talented and motivated students),
Fitchburg (Destination Imagination, mock trial)
Framingham (consultant/teacher and resource model focusing on self-help for the student and differentiated instruction),
Gill-Montague (after-school program, grade 6),
Groton-Dunstable (New Horizons for Youth enrichment project),
Hanover (after-school program),
Hingham (Johns Hopkins Talent Search, Science Challenge, math and science courses)
Hopedale (Destination Imagination),
Lawrence (partnership with Northern Essex Community College to provide a simulated college experience with instructional technology component in a summer academy and weekend programs for students and their families in grades 3-8; writing program in collaboration with Andover Bread Loaf at Phillips Academy, Andover and Middlebury College's Graduate School of English, Youth Explorations in Science, PALS, a partnership between Phillips Academy and the Leonard School in Lawrence that is a four-week summer program of enrichment in math, language arts, computer usage can career-oriented activities, literature circles, Culture Works, a partnership with the Addison Gallery of Art)
Leicester (after-school program)
Longmeadow (after-school writer's workshop, art workshop, keyboarding, science)
Marshfield (after-school program with academic themes),
Medford (no details),
Mendon-Upton (Destination Imagination),
Methuen (no details),
Nashoba Regional (after-school program, Destination Imagination, Math Counts)
Norwood (math, science, foreign language),
Orange (after-school and summer enrichment programs),
Pentucket Regional (community service learning, after-school enrichment)
Plymouth (Destination Imagination, robotics, Future Problem Solving, CTY)
Reading (after school math and science program)
Scituate (no details)
Tisbury (EPGY* math, after-school program)
Triton Regional (no details),
Watertown (enrichment by content specialists)
Westborough (no details),
Westwood (Virtual High School courses)
Wrentham (classroom enrichment, Talents Unlimited model for grade6. Math curriculum compacting advanced literature and reading programs, enrichment library, and after-school program, Destination Imagination).

[17] Districts reporting a combination of full- and part-time teachers at the PreK-5 level were: Arlington, Barnstable, Barnstable Horace Mann Charter School, Beverly, Bridgewater-Raynham, Canton, Chelsea, East Longmeadow, Framingham, Taunton, Watertown

Districts reporting only full-time teachers of the academically advanced at the PreK-5 level were: Abby Kelley Foster Charter School, Bedford, Berlin, Boston, Brockton, Halifax, Lowell Community Charter School, Marlborough, Methuen, New Bedford, Norton, Norwood, Oak Bluffs, Orange, Palmer, Peabody, Plymouth, Somerset, Tantasqua (Sturbridge), Tewksbury, Waltham and Worcester

Districts reporting only part-time staff at the PreK-5 level were: Ashland, Brewster, Brookline, Edgartown, Fall River, Falmouth, Hanover (after-school), Hingham, Holliston, Lawrence, Leicester, Millis, Nashoba Regional, Northampton, Rockland, Seven Hills Charter School (in planning), South Boston Harbor Academy Charter School, Southern Berkshire Regional, Up-Island Regional, West Boylston, Westborough, and Westford.

[18] Barnstable, Boston, Lowell Community Charter School, Methuen, Waltham, Whitman-Hanson, Worcester, and Wrentham reported full-time coordinators. Abby Kelley Foster Charter School, Arlington, Bridgewater-Raynham, Brockton, Brookline, Canton, East Longmeadow, Falmouth, Framingham, Hingham, Holliston, Norton, Palmer, Peabody, Pentucket Regional, Plymouth, Seven Hills Charter School, Tewksbury, Watertown, and West Boylston reported part-time coordinators.

[19] Percentages were calculated using numbers reported in the survey compared with the grade level enrollments in the reporting districts (298,383 at PreK-5; 138,473 at grades 6-8) from 2000-2001, the latest data available.

[20] Other topics frequently mentioned were sessions on higher level thinking, recognition of a range of abilities, and education strategies and philosophies for dealing with all students in a heterogeneous classroom. Two to three districts mentioned Advanced Placement vertical teaming, assessment, and the education of exceptional children as a group.

[21] Ten districts reported that they sent teachers to conferences, such as the New England Gifted and Talented Conference, or to programs offered at the University of Connecticut and the College of William and Mary in Virginia, both of which have federally-funded research centers for gifted education.

[22] Districts and high schools returning the survey were:
Abington, High School, Academy of Strategic Learning (Amesbury), Agawam High School, Algonquin Regional High School (Northboro-Southboro Regional), Amherst-Pelham Regional High School, Andover High School, Apponequet Regional High School (Freetown-Lakeville Regional), Assabet Valley Regional Technical High School (Marlboro), Athol High School (Athol-Royalston Regional), Avon Middle High School, Ayer High School, B.M.C. Durfee High School (Fall River), Junior/Senior High School (Webster), Belchertown High School, Bellingham High School, Belmont High School, Beverly High School, Blackstone Valley Regional Vocational Technical, Blackstone-Millville Regional High School (Blackstone), Boston Latin School (Boston), Bourne High School, Braintree High School, Bridgewater-Raynham Regional High School, Bromfield School (Harvard), Brookline High School, Burlington High School, Cape Cod Technical High School, Charlestown High School (Boston), Chatham High School, Clinton High School, Dartmouth High School, Dean Technical High School (Holyoke), Dedham High School, Dighton-Rehoboth Regional High School, Doherty Memorial High School (Worcester), Douglas Middle Senior High School, Dracut High School, East Bridgewater High School, East Longmeadow High School, Easthampton High School, Everett High School, Fairhaven High School, Fitchburg High School, Foxborough High School, Framingham High School, Franklin High School, Gardner High School, Gateway Regional High School (Huntington), Gloucester High School, Grafton High School, Greater Fall River Regional Vocational, Greater New Bedford Vocational Technical School, Greenfield High School, Groton-Dunstable Regional High School, Hamilton- Wenham Regional High School, Hampshire Regional High School (Westhampton), Hanover High School, Harwich High School, Haverhill High School, Hingham High

School, Holliston High School, Holyoke High School, Hoosac Valley High School (Adams-Cheshire Regional), Hopkins Academy (Hadley), Hopkinton High School, Joseph Case High School (Swansea), Lenox High School, Leominster High School, Lincoln-Sudbury Regional High School, Littleton High School, Lowell High School, Lynn Classical High School, Lynnfield High School, Malden High School, Mansfield High School, Marblehead High School, Martha's Vineyard Public Charter School, Masconomet Regional High School (Topsfield), Maynard High School, Medfield High School, Methuen High School, Middleboro High School, Minnechaug Regional High School (Hampden-Wilbraham Regional Schools), Minuteman Regional Technical High School (Lexington), Monson High School, Monument Mountain Regional High School (Berkshire Hills Regional Schools), Mt. Greylock Regional High School, Murdock Middle/High School (Winchedon), Narragansett Regional High School, Nashoba Regional High School (Bolton), Nashoba Valley Technical High School, Needham High School New Bedford High School, New Mission High School (Boston), Newburyport High School, Newton North High School (Newton), North Attleboro High School, North Middlesex Regional High School (Townsend), North Quincy High School (Quincy), North Reading High School, Northampton High School, Norton High School, Norwood High School, Oakmont Regional High School (Ashburnham-Westminste Regional Schools), Oxford High School, Peabody High School, Pentucket Regional High School (West Newbury), Pioneer Valley Regional High School (Northfield), Pittsfield High School, Quaboag Regional High School (Warren), Ralph C. Maher Regional High School (Orange), Reading Memorial High School, Revere High School, Rockland High School, Rockport High School, Sabis International Charter School (Springfield), Sandwich High School, Science and Technology High School (Springfield), Seekonk High School, Sharon High School, Smith Vocational & Agricultural High School (Northampton), Snowden International High School (Boston), Somerset High School, Somerville High School, South Shore Vocational Technical High School' Southbridge High School, Southern Middlesex Regional High School, Southwick – Tolland Regional High School, Springfield Central High School, Stoneham High School, Sutton High School, Swampscott High School, Taconic High School (Pittsfield), Tantasqua Regional High School (Fiskdale), Tewksbury High School, Tri-County Regional Vocational Technical School (Franklin), Turner's Falls High School (Gill – Montague Regional Schools), Wachusett Regional High School (Holden), Wareham High School, Watertown High School, Wayland High School Wellesley High School, West Roxbury High School (Boston), West Springfield High School, Westfield High School, Westford Academy (Westford), Westport High School, Westwood High School, Weymouth High School, Whitman-Hanson Regional High School (Whitman), Whittier Regional Vocational Technical High School (Haverhill), Wilmington High School, Winthrop High School

[23] There was a seventh subject category for advanced and honors courses, a generic "Other" that was responded to by fewer than 10% of the high schools. The majority of courses that high schools listed under "Other" were computer courses (C++, Visual Basic, Web Design and Development, Computer Programming, and Cisco Networking). Other courses included accounting, marketing, architectural drafting, electromechanical engineering, engineering design, FAA Ground School training, humanities, archaeology, film appreciation, multimedia, speech, psychology, and sociology.

[24] The specific schools and numbers can be found on http://www.doe.mass.edu/osl/mastery/01award.html.

[25] Teachers responding worked in these districts: Acton, Arlington, Athol-Royalston, Barnstable, Bedford, Blackstone-Millville, Boston, Bridgewater-Raynham, Brookline, Burlington, Chelsea, East Longmeadow, Falmouth, Foxboro, Hingham, Hyannis, Marblehead, Marlboro, Methuen, Nashoba Regional, Norton, Plymouth, Quincy, the Sage School (independent), Somerset, Townsend, Tyngsborough, Wareham, West Boylston, Whitman Hanson, Worcester, and Wrentham; Milton Academy and the Sage School (independent schools), and Gifted and Talented Education Services, Inc., a private organization offering consultation and independent assessments.

[26] Some teachers did not respond to this question, hence the total of degrees is smaller than the number of respondents.

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

[X] This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

[ ] This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").